

Leading the way



2004 Annual Highlights

NDSU Extension Service • North Dakota Agricultural Experiment Station

NDSU

North Dakota State University

Leading the way

As North Dakotans face increasingly complex issues, the NDSU Extension Service and North Dakota Agricultural Experiment Station continue to work to meet people's needs as they adapt to their changing environments.

Faculty and staff work with people across the state, and increasingly, all over the world. NDSU's researchers, developers and educators strive to help people solve problems and improve the quality of life.

We've improved crops and livestock, shown producers and businesses how to become more profitable, given economic development a boost, found ways to protect the environment, helped families teach their children, and dealt with stress and natural

disasters. We're also addressing new opportunities such as agri-tourism and issues including biosecurity.

Some of our faculty and staff may be your friends or neighbors. They live and work in your communities, listen to your questions and concerns, and provide you with the help and information you want. Eight Research Extension Centers, strategically placed throughout the state, allow researchers to study local problems and develop techniques and technology that will work under the area's conditions. Numerous advisory boards and panels provide ideas and help direct research and educational efforts.

No matter where you live, we can stay in touch with you. Perhaps you've met some

of our staff at field days and seminars, or sought advice and information from staff in one of the 53 county Extension offices across the state or one of our many Web pages. High-speed Internet access is available in nearly all of our county Extension offices and in RECs. Two-way videoconferencing capabilities are in 24 locations. Technology is bringing our researchers and outreach specialists ever closer to the people they serve.

This report is a sampling of the efforts by faculty and staff of the NDSU Extension Service and North Dakota Agricultural Experiment Station. We hope it gives you a flavor of our activities and a glimpse of how we work with people throughout the region.



Jim Venette, Patricia Jensen, Duane Hauck and Ken Grafton

If you would like more information on the programs in this publication, contact the faculty and staff listed on the corresponding pages. If you would like more information about our other programs or have other questions, comments or suggestions, please contact any one of us.

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The weather took a heavy toll on North Dakota's crop production this year, and North Dakota State University responded to the challenge.

Southwestern counties had the worst drought longtime residents can recall, while

NDSU responds to weather's impact on crops, livestock

up to three times more rain than normal fell in counties in the north-central part of the state. To make matters worse, up to 18 inches of snow fell in some northern counties in May, just as farmers were planting. Southwestern counties had the added blows of three serious frosts in June as crops were emerging, followed by insect infestations. Then a widespread frost hit the state in mid-August.

"This year was, I'm not kidding you, a year of plague," said Brenda Rettinger, Extension agent for Bowman County in southwestern North Dakota.

Extension Service staff swung into action.

"The main thing that most of us do is activate the county USDA (U.S. Department of Agriculture) emergency committee," said Tim Semler, Extension agent for farm business management in Bottineau County, which is in north-central North Dakota.

The emergency committee includes the county Extension agent for agriculture, county director of the Farm Services Agency and district conservationist for the Natural Resources Conservation Service. They, with

input from FSA staff, determine whether farmers have suffered a loss in excess of 30 percent in any crop or hay land. If losses have exceeded that level, the committee's findings help activate USDA emergency programs to help farmers.

Extension agents also spent a lot of time answering producers' questions. Farmers wanted to know how late they could plant, what their chances of bringing in a good crop might be, what to plant if the crops they planned to grow wouldn't work and how to deal with crop insurance issues. Producers in southwestern North Dakota were worried about higher levels of nitrate in their forage crops, which is the result of drought conditions, because nitrate in larger concentrations can poison cattle. Others whose crops failed needed to find a source of feed for their cattle.

Some Extension agents put out weekly agriculture alerts, wrote articles or columns for the local newspaper and provided information and advice in newsletters, news releases and radio programs. For farmers who have gone high tech, Extension agents offered help through faxes, e-mail and the Web. Extension agents in the southwestern counties compiled feed lists of people with forage for sale and directed producers needing forage to North Dakota State University and Montana State University's feed lists.

Conference calls also were a big part of this year's efforts to deal with the adverse weather. State Extension specialists spoke weekly with Extension agents and staff at the Research Extension Centers about crop conditions throughout the growing season.





In the wake of the heavy frost in August, the NDSU Extension Service launched a Web site to help producers deal with late-maturing and frost-damaged crops. Extension staff and NDSU Agribusiness and Applied Economics faculty kept the state's congressional delegation, governor's office and state Agriculture Department officials informed of the situation through conference calls.

Extension specialists also worked with county agents to collect data on producers' economic losses because of the weather. The state's congressional delegation used the information to help obtain disaster aid for producers.

Crop losses totaled more than \$530 million, according to Larry Leistritz, a professor in the Agribusiness and Applied Economics Department. Federal multiperil

crop insurance should cover about \$201 million of that, he said. That leaves the state's producers with a net loss of at least \$329 million.

Soybeans took the hardest hit at \$170.6 million, followed by hay at \$109 million and corn at \$84.3 million.

NDSU Extension Service Director Duane Hauck is pleased with the staff's work. "I think this year's effort is just a typical example of how effectively and efficiently the Extension system can respond to emergency situations, changing situations," he said.

The unusual weather had a longer-term impact on NDSU as well. The extremes gave researchers a chance to see how crop varieties they developed performed under adverse conditions and illustrated the importance of breeding plants that mature earlier, have a tolerance for cold and are disease resistant. This year's experience also stressed the need to find ways to use crops that don't reach maturity.

What happened this year will give researchers an opportunity to look at their work in a little different light, according to Ken Grafton, director of the North Dakota Agricultural Experiment Station. "But you may never have a summer like this again," he said.

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Marketing CD Targeted to Farm Women

Farm women can upgrade their commodity marketing skills with the release of a new interactive educational program on CD.

“The program presents base information on commodity marketing, government programs and crop insurance, all the information needed to make fully informed risk management decisions,” says Cole Gustafson, NDSU Agribusiness and Applied Economics professor. “Farm women are often the first point of contact and have primary responsibility for calling elevators and others for information.”

In addition to defining important crop marketing terms, the program illustrates different marketing strategies, including cash sales, forward contracting, hedging and options.

Crystal Shaunaman, who co-authored the program as a graduate student, notes that it is important for both spouses to understand the ramifications of different risk management strategies as the timing and level of returns may vary. The household and farm unit have different cash requirements, and this educational program may assist in resolving alternative priorities.

A copy of the program can be obtained from county offices of the NDSU Extension Service. Shaunaman is now a Sheridan County Extension agent.

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North Dakota Shoppers Unaware of Genetically Modified Foods

Even though grocery stores carry a number of genetically modified food products, North Dakotans know very little about them.

Sixty-four percent of the North Dakotans questioned in a recent survey didn't know what genetically modified organisms are. Even after the questioner told them, only 37 percent said genetically modified food is available at grocery stores, although it is estimated that up to 70 percent of items on grocery store shelves contain genetically modified ingredients.

Cheryl Wachenheim, an NDSU associate professor of Agribusiness and Applied Economics, and William Lesch, a marketing professor at the University of North Dakota, conducted the study.

The survey defined genetic modification as adding genes to plants or animals to change the makeup of the original organism. This moves genetic material from one organism to another to produce plants or animals with desired characteristics faster than through traditional cross-breeding.

The survey found that more than half of the people polled would prefer to buy genetically modified hamburger or noodles if they had more vitamins and minerals or better flavor than conventional hamburger or pasta, provided both varieties were the same price. The majority of those surveyed would approve of scientists using genetic modification to develop health benefits, hormones to help combat diabetes and wheat with vitamin A to prevent blindness. Two-thirds of those polled approved of plants created using genetic modification, while 72 percent disapproved of genetically modified animals.

A copy of the study is online at <http://agecon.lib.umn.edu>.

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Calf AID Program Unveiled

North Dakota beef producers can be on the leading edge of the industry's technology advancements by participating in the Calf AID program, according to Kris Ringwall, Dickinson Research Extension Center director.

Calf AID is a collaborative effort among beef producers, scientists and research entities to tag calves electronically to identify them, verify beef quality, and provide performance, reproduction and sales data that producers can use to make good management decisions.

The program is also part of a statewide biosecurity effort to protect producers from potential outbreaks of biological diseases that could affect cattle and the beef available to consumers. Calf AID is designed to meet the U.S. Animal Identification Plan's proposed identification standards.

The program provides an electronic identification tag along with all the equipment, labor and handling facilities to process calves for a fee of \$4 per cow/calf pair. Cows, yearling heifers, yearling steers and bulls also can receive the electronic ID for a minimal charge.

The North Dakota Reserve Veterinarian Corps, which consists of 21 veterinarians from across the state, is part of the Calf AID team.

“The Calf AID program calls for the use of vaccines and other veterinary supplies,” Ringwall says. “It is important for producers to have one-on-one relationships with their veterinarians for the development of a herd health protocol and other beef production issues.”

The Calf AID team also will provide producers with a complete data analysis of livestock herd performance.

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NDSU College Launches Distance Education Program

NDSU's College of Agriculture, Food Systems, and Natural Resources launched its distance education program by offering four courses during the fall semester.

Distance education means an instructor at NDSU can teach students anywhere by using technology such as videoconferencing, Web sites, CDs, e-mail and Blackboard, an electronic course management system.

The courses available this fall are World Food Crops, Genetics, Economic Entomology and Editorial Processes. College officials are working on a few more courses for the spring semester.

The distance education concept developed out of NDSU's efforts to help find other careers for farmers who were leaving farming, many for financial reasons, in the 1980s.

This is a good time to begin distance education because the technology has improved significantly, and Research Extension Centers and county Extension offices, which are located throughout the state, can serve as learning centers, according to David Saxowsky, an associate professor in the Agribusiness and Applied Economics Department who has been heavily involved in developing the college's distance education program. Distance education also is the next logical step in NDSU's mission as a land-grant university, he said.

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Center for Community Vitality Provides Greater Accessibility to Information

Resources on community economic development and leadership recently became accessible through the NDSU Center for Community Vitality. The center coordinates and markets numerous outreach efforts from NDSU that are designed to help create vital communities in North Dakota, according to Kathy Tweeten, center director and community economic development specialist.

Tweeten describes the center not as a place but rather an organizational structure to make the outreach resources of NDSU easier to access. By telephoning Tweeten or visiting the center Web site at www.ag.ndsu.edu/ccv, individuals can gather information on the Institute for Business and Industry Development, Rural Leadership North Dakota, Small Ag Business Development program and a number of other programs dedicated to community economic and leadership development.

"The center will pull all of the pieces together," Tweeten says. "We have so many great resources at NDSU. This will give us a more effective way of telling people what they are."

Bill Klein, Extension agent/economic development in McIntosh County, said the center will help him be more efficient. "In the past when I needed information, I would have to go to several different resources," he said. "Now, by using the Internet, I will be able to access several resources at one Web site."

Jodi Bruns, Extension agent in Dickey County, agrees. "The NDSU Center for Community Vitality will provide the necessary expertise to see a project to completion by providing a site to seek out information on community and economic development issues. There are North Dakota residents with great ideas for making their communities thriving places to live, but sometimes they are faced with roadblocks that prevent them from turning an idea into a tangible project. The center will eliminate some of these roadblocks."

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North Dakota Teens Learn Food Safety

Twenty-nine percent of employed 15-year-olds work in eating and drinking establishments, according to a 2000 report by the U.S. Department of Labor. Considering this statistic and the 76 million Americans sickened annually by foodborne illness, NDSU experts are educating youth about the significance of proper food handling.

"Teens Serving Food Safely is a statewide education effort to improve food handling among North Dakota youth," says Julie Garden-Robinson, NDSU Extension Service food and nutrition specialist.

The project provides training and certificates in food safety. "About 600 students have completed the series and passed the exam," Garden-Robinson says. "Average test scores on food safety increased from 59 percent on the pre-test to 96 percent on the post-test. One month later, the average score was 93 percent, indicating good retention."

During fall 2003, teachers utilizing the curriculum requested food/refrigerator thermometers to distribute to students. Despite outbreaks linked to undercooked meat, only 5 percent of Americans use a food thermometer, according to Garden-Robinson.

Contributions from the North Dakota Beef Commission, North Dakota Nutrition Council, USDA Meat and Poultry Hotline and the regional office of the Food and Drug Administration have been used to assemble about 2,000 kits that include thermometers, food temperature magnets and printed materials.

The kits will go to North Dakota youth who participate in the food safety series held in high schools or as workshops offered by the Extension Service in 2004-05.

Garden-Robinson has high expectations for the program: "It is intended that this North Dakota effort become a national food safety model for youth."

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N.D. Farm Household Spending Increases

The average living expenditure of 291 farm families in the North Dakota Farm Business Management Education program was \$40,517 in 2003. That's an increase of \$2,378, or 6.2 percent, from 2002.

Andrew Swenson, farm management specialist with the NDSU Extension Service, said families purchased more goods and services in 2003.

"The likely cause was a strong North Dakota net farm income that increased by nearly 50 percent in 2003 because of good small-grain yields, strong crop prices and improved livestock production profitability," he said.

The largest expenditure increase was for vehicle operation and purchases, which rose from \$3,785 in 2002 to \$4,915 in 2003. Other increases were for utilities, up about 15 percent to \$2,052, and education at \$1,118, up \$185 from 2002. Outlays for personal expenses and recreation (\$5,354), and contributions and gifts (\$2,139) were nearly unchanged from 2002.

The largest expense category was medical care and health insurance, which increased nearly 9 percent in 2003 to \$7,040 per family. Other large expenditures were for shelter (includes household supplies, repairs, furnishings, appliances), \$6,275; food, \$5,973; and clothing, \$1,888.

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Attracting a high-tech company from Silicon Valley to Langdon, population 2,101, isn't easy, but that's just what happened. Software company DataTic moved into the Langdon Research Extension Center's new Vic Sturlaugson Learning Center in March.

Tech center comes to Langdon

DataTic has developed software that provides real-time prices and volume information for vegetables such as lettuce and celery, according to Scott Lawley, chief technical officer and president of DataTic. "It's not any different than what the Chicago Board of Trade provides, but our information involves produce that is perishable."

The price discovery system is mostly contract driven based on market demands. It's at www.producepoint.com. "We are not limited to certain commodities," Lawley says. "We are able to track any tradable commodity such as hay, timber or energy, but preferably one that is perishable."

Moving into the Sturlaugson Center provided DataTic a place to call home while a permanent facility was being remodeled in Langdon. "Being in this facility has other benefits," Lawley says. "We have expanded our relationships with NDSU and UND. If we want to pursue other research initiatives, we know the people who can help us. The researchers at the LREC have a great deal of expertise and are also our eyes and ears to other university experts."

The Vic Sturlaugson Learning Center provides resources that will allow the Langdon Research Extension Center to be more engaged in addressing problems facing producers and rural communities in northeastern North Dakota, according to Randy Mehlhoff, LREC director.

Along with the business incubator, the facility has a large meeting room for educational gatherings and Extension workshops, a computer and video conference classroom to offer distance education

classes and work force training, and office headquarters for LREC staff.

"We designed the building to continue the great agriculture research that we do, but we also wanted to add components that would help the region address issues associated with rural living such as outmigration and distance education," Mehlhoff says. "For example, we've got people that drive to Devils Lake or Grand Forks to take classes at Lake Region State College and the University of North Dakota. Through distance education, future residents may not have to do that."

Mehlhoff is also excited about the partnership the LREC has formed with Lake Region State College in Devils Lake. Kevin Misek is a faculty member at Lake Region but stationed in the NDSU learning center. As the adult farm business management coordinator and instructor, Misek meets with farm families and managers to enhance their marketing and financial recordkeeping skills.

"It's a win-win situation for everybody," Misek says. "I work closely with farm families while at the same time I'm up to speed on all the research that is going on at NDSU."

"The producers make their own decisions on what they want to plant, but I can give them the latest crop information to assist them in their decision-making process. At the same time, I work with them on their business management skills."

DataTic will soon move to its new home, but Mehlhoff already is working with another technology-based company to move into the space. "The Sturlaugson Center has completely exceeded my expectations," Mehlhoff says. "Technology companies are now looking at our area as a place to start a business or relocate here. Also, in just a few short months, over 140 seminars, workshops or other meetings have been held here at the center."

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Building partnerships to benefit people, NDSU joins food security team

American agriculturists and the food processing industry pride themselves on the ability to provide wholesome, quality food products that are readily available and affordable. Elevated terrorist threats in recent years have stimulated extra care in food safety and security.

A U.S. Department of Homeland Security grant puts NDSU researchers in a position to help find methods to prevent deliberate contamination of the nation's food supply. NDSU became a partner in one of three national Centers of Excellence, the University of Minnesota-led National Center for Food Protection and Defense.

"This grant puts NDSU at the forefront of national and international food security protection," says Patricia Jensen, NDSU vice president and dean of Agriculture, Food Systems, and Natural Resources. "It is recognition of what has happened on this campus in terms of food safety, food security and biosurveillance."

The University of Minnesota, NDSU, Michigan State University and the University of Wisconsin-Madison will be assisted by 12 other universities, independent research facilities, state health and agriculture agencies, professional organizations, agriculture and food industry companies, and private-sector consultants.

"The breadth and depth of food security knowledge we were able to pull together for this effort is unparalleled," says Frank Busta, director of the new center.

NDSU's main contributions will be in risk and crisis communication, as well as economic analysis. Tim Sellnow, NDSU Communications professor, will lead a team of NDSU graduate students and educators from other campuses to develop risk communication strategies, including a network of alerts in the case of a bioterrorism incident.

Sellnow's task is to design a communication approach that treats the public and news media as resources. "If we communicate effectively, we can maintain public confidence and work with the media to quickly resolve rather than intensify any crisis situation," Sellnow says.

On the economic side, William Nganje, NDSU Agribusiness and Applied Economics assistant professor, will work with other NDSU faculty and graduate students to estimate the economic impact of additional surveillance in the food industry.

Nganje is certain that NDSU also has a lot to offer in terms of food protection and food safety education. "We have expertise in all areas from farm to fork," he says.

Sellnow and Nganje are part of the Great Plains Institute for Food Safety at NDSU, a campuswide, multidisciplinary approach to detecting and preventing food safety problems.

NDSU President Joseph A. Chapman echoes Nganje's confidence and enthusiasm. "Our researchers have the knowledge and research expertise to contribute to this critical area of national security. We are proud to participate in the effort."

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Equine programs growing at NDSU

A growing interest in NDSU's equine studies program reflects the national trend toward horse-related recreational activities, says Ken Odde, head of the Department of Animal and Range Sciences. "The equine interest has really grown nationally," he says.

NDSU established a major in equine studies in 2001 and has seen gradual growth in the program ever since, Odde says. There are now 40 students majoring in equine studies and six courses dedicated to equine topics.

"This is also a program that has broad interest across campus," Odde says. About 100 students from outside fields of study enroll in at least one equine course. All four sections of the equitation, or riding, classes are filled.

The equine program also supports the 4-H equine program, including organizing 4-H horse camps and assisting with the horse activities at the North Dakota State Fair.

"We do it by being a source of information for equine-interested 4-H'ers through our county Extension network and 4-H clubs," Odde says. More than 1,000 youth are enrolled in 4-H horse programs in North Dakota.

Youth are also involved with the equine program through the NDSU show and rodeo teams that compete throughout the Upper Midwest.

The NDSU program includes equine research and education at the Dickinson Research Extension Center. A horse field day at Dickinson covered topics ranging from hoof care to horse behavior to ultrasounds for mares.

The Dickinson REC collaborates to study equine nutrition, nucleotide supplementation and West Nile virus. These projects include specialists and cooperation from the University of Minnesota, Michigan State, Dickinson State University and Rutgers University.

The equine program's major boost came with the recent construction of the 600-foot by 134-foot stall barn adjacent to the North Dakota Horse Park. The stall barn is the initial component of a large-scale equine center.

"That's a tremendous asset. It's provided us with an enclosed, comfortable location for our laboratory horses and our riding horses," Odde says. The barn also includes stall space for the rodeo and show team horses.

"We're able to provide quality support for those programs with the new facility," Odde says.

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Three-Year Fly Ash Study Near Completion

Mud in feedlots can cut animal performance and producer profit, according to Vern Anderson, animal scientist at the Carrington Research Extension Center.

A team of scientists from the coal power industry, the University of North Dakota and NDSU has looked at the potential of using fly ash to stabilize soil in livestock pens. Known for its cementlike properties, fly ash was incorporated into the soil to reduce mud and limit the size and depth of wet areas, therefore improving animal performance.

After three years of study at the Carrington REC, Anderson notes positive results. Bison bull calves in pens treated with fly ash showed an advantage over control calves in April, May and June, when spring thaw and summer rains took their toll. Gains in the fly ash-treated pens were 1.88 pounds per head per day compared with 1.53 pounds in pens that did not receive fly ash.

Feed efficiency also increased beginning in April with 13.09 pounds of feed per pound of gain required in untreated pens versus 10.40 pounds in pens treated with fly ash. The combined improvement in gain and feed efficiency resulted in a reduced feed cost of 13 cents per pound of gain during the muddy period and 6 cents per pound throughout the whole feeding trial, January through June.

“The results suggest that fly ash pens will provide for improved production from drier conditions,” says Anderson. “Longevity of the surface is still under investigation, but after three years of use, surface wear appears to be minimal.

“Economic returns using fly ash are highly positive,” says Anderson. “The magnitude of the improvement for bison is significant, but we could expect possibly greater improvements in performance of beef cattle. The expected difference relates to the potential of cattle to gain more pounds per day than bison. Making cattle more comfortable could accentuate this potential.”

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N.D. 4-H'ers Focus on Technology

More than 80 4-H'ers in Williams, Rolette and Mountrail counties and Fort Berthold served as national youth leaders in the Rural Community Mapping: 4-H Youth Favorite Places project. It's part of a nationwide community mapping effort that involves 4-H members in North Dakota, Oregon and 13 other states.

The 4-H members used global positioning satellite technology to pinpoint their favorite recreational sites. They also provided directions to the site, people to contact for more information, hours the attraction is open to the public, photos and testimonials from youths about the attraction.

The project has two aims. One is attracting families to small towns and rural areas to help stimulate their economies. Annually, an estimated 6 million 4-H families vacation in the United States and collectively spend more than \$1 billion. The other purpose is drawing rural teens into community service projects that will involve them in community planning.

Also, 4-H youth and the state seniors' health insurance counseling office teamed up at the North Dakota State Fair to teach hundreds of senior citizens how to use the Web to learn more about Medicare.

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What's that Weed?

It often ends up in a producer's pickup, tractor or kitchen table. What is it? It's the annual North Dakota Weed Control Guide book.

“The guide is based on federal and state herbicide labels, research at North Dakota Agricultural Experiment Stations and other information from the North Dakota Department of Agriculture,” according to Richard Zollinger, NDSU Extension Service weed specialist.

The guide is available from NDSU Extension Service county offices, from NDSU Agriculture Communication at (701) 231-7882 and on the Web at www.ag.ndsu.nodak.edu/weeds/. The next version will be out in January.

The guide has several sections:

- Types of herbicides available by crop
- Special weed problems, such as knapweed or saltcedar
- A general information section for issues such as organic soil testing, spray and vapor drift, and sprayer cleaning
- Herbicide carryover to the next year
- Rotation restrictions for crops grown in North Dakota
- Restrictions on grazing, feeding or haying of crops treated with herbicides
- An approximate retail price list of herbicides and adjuvants for 2004

“The guide has an easy-to-follow format that should help producers with sometimes difficult herbicide application decisions,” Zollinger says. “The guide also lists other publications that are available to provide even more specific information.”

The information only applies to North Dakota, according to Zollinger. “That's because many herbicide uses are allowed only by supplemental or specific labeling for North Dakota. Those using the supplemental or specific labeling are required to have the labeling in their possession at the time of application.”

The guide provides an update on new or discontinued herbicides, possible Section 18 registrations and IR-4 projects for the year.

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Beef Systems Center of Excellence Continues to Gain Momentum

If North Dakota fed and processed 500,000 head of beef cattle annually, the direct additional contribution to the economy would be \$300 million, according to Greg Lardy, NDSU Extension Service beef cattle specialist. Yet there are no large-scale slaughter facilities in North Dakota, South Dakota or Montana.

Recognizing this loss in economic opportunity, NDSU experts and industry professionals introduced the concept of a Beef Systems Center of Excellence. The plan is to provide leadership and expertise to develop a vertically coordinated beef processing industry in North Dakota.

On March 10, the Beef Systems Center of Excellence gained momentum when the North Dakota Association of Rural Electric Cooperatives signed a \$1 million USDA grant to establish an Agriculture Innovation Center. The center's first project is the Beef Systems Center of Excellence.

Lardy, Ken Odde, Paul Berg, Marty Marchello and Travis Maddock make up the NDSU Beef Systems Center of Excellence team. Wally Eide, Agriculture Innovation Center, and Wade Moser, North Dakota Stockmen's Association, are also key contributors. These individuals, with the help of farm organizations and commodity groups throughout the state, intend to fulfill their first objective in 2005 by developing the actual center, which will include a slaughter and fabrication facility near NDSU.

The facility will provide internships and part-time employment for NDSU students studying meat science.

Lardy also sees the facility serving a broader purpose. "We hope that it will spur development throughout the state," he says.

The Center of Excellence team predicts that small slaughter and processing plants for regional markets would be an asset to North Dakota producers because of the potential to reduce shipping costs and increase marketing options. Team members are in the process of identifying a private business partner for the center.

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Collaborative Efforts Boost Income for Dairy Producer

In a cooperative project with NDSU, Tuttle-area dairy producer Jack Spah boosted annual income from his 45-cow herd by more than \$20,000. In the demonstration project, Spah switched from using hay grown on his farm to hay grown by a commercial alfalfa grower.

Spah's hay had a relative feed value of about 105 while the purchased hay at \$80 per ton had an RfV of about 155. "Most producers would say they can't afford hay at \$80 per ton, but in many cases the increased milk production more than pays for the hay," says J.W. Schroeder, NDSU Extension dairy specialist. The Spahs witnessed this scenario firsthand.

Jack and Kathy Spah agreed to the project on their farm after becoming involved in the North Dakota Dairy Diagnostic program. The Spahs are among more than 50 producers who have enrolled in the program. Participants rely on a team of experts they choose for advice on improving productivity, efficiency and profitability, as well as reducing costs, labor and herd health problems.

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Research Extension Centers Hosts to Thousands

More than 5,200 people visited NDSU's Research Extension Centers for tours, field days and other events during the 2004 growing season. Hundreds of thousands more logged onto the centers' Web sites.

The centers allow researchers to work on problems the state faces and test new management techniques and crop varieties under various conditions. The centers also host sessions and tours for researchers, producers, consultants and others to learn about the latest techniques and technology in raising crops and livestock.

Here are some highlights of 2004:

- Agronomy Seed Farm near Casselton harvested a bumper cereal grain crop for the second year in a row. The fields also produced good plot data for researchers to evaluate new and old crop varieties.
- Carrington Research Extension Center completed six studies on expanding interest in feedlots and the use of North Dakota crops and byproducts. Events included a field tour for about 350 U.S. and foreign International Sunflower Conference attendees.
- Central Grasslands Research Extension Center near Streeter hosted two Chinese scholars who studied the effect of grazing on vegetation and developed a seed bank. The center also was the site of a study on grazing and root penetration and development.
- Dickinson Research Extension Center celebrated its 100th anniversary. The staff also made agronomic presentations throughout southwestern North Dakota.
- Hettinger Research Extension Center hosted a joint, three-day meeting of two national sheep research groups. Other events included a regional animal behavior conference.
- Langdon Research Extension Center dedicated its Vic Sturlaugson Learning Center. The REC also formed partnerships with Lake Region State College, Devils Lake, for a farm business management program and the Cavalier Job Development Center to help a software engineering company get started.
- North Central Research Extension Center at Minot is in its fifth year of a study on rotating canola with other crops. Events included its 60th annual field day followed by a tree research tour.
- Williston Research Extension Center participated in the MonDak Regional Ag Open. It encourages partnerships among researchers, growers, economic developers, agribusinesses and food processors to promote irrigation development and valued-added agricultural processing in North Dakota and Montana.

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Having fun – 4-H Outdoor Skills program

Outdoor Skills is one of the fastest growing 4-H programs in North Dakota, luring new faces and renewing enthusiasm for 4-H.

Introduced in 2000-01, the Outdoor Skills program includes shooting sports and about a dozen project areas such as waterfowl, wildlife and bird identification,

designing and making outdoor clothing, outdoor cookery, safe and ethical fishing skills and outdoor survival.

Outdoor Skills was introduced “because of the level of involvement of North Dakota residents in outdoor-related activities like hunting and fishing. Outdoor recreation is one of the largest economic engines in the state,” says Joe Courneya, an Extension education program design specialist who helped develop the Outdoor Skills program.

Last year, the Outdoor Skills program reached about 1,750 North Dakota youth and 220 volunteers who donated the equivalent of \$74,000 in time. Seventeen counties reported county programs.

The program is also attracting a new donor base. Total contributions from outside donors reached \$60,000. A newly funded traveling trailer is available to provide an air rifle and BB gun shooting range at county fairs and other events.

Shooting sports have attracted a new influx of people to 4-H, says Al Ulmer, North Dakota 4-H Shooting Sports coordinator and LaMoure County Extension agent.

Volunteer Dan Rognlie, who teaches archery skills every Saturday afternoon to Cass County youth, agrees. “I think it’s added a lot more kids to the program,” he says.

“It offers another avenue to introduce 4-H to kids,” adds Bob Staloch, who instructs youth in black powder, shotgun and air pistol skills in Cass County. “About half of my students, on the average, are non-4-H kids... It gets them interested and introduced to 4-H. In the Fargo metro area, there are so many other things for kids to do. We’re really competing against some other things to try to get kids to come out.”

Of the 650 youth enrolled in Shooting Sports, 40 percent are new to 4-H, according to Ulmer.

Each instructor must become certified before teaching youth in Shooting Sports, which is the only 4-H program with that type of requirement. Volunteers in 30 counties are certified in archery, air rifle, air pistol, trapshooting, black powder shooting and .22-caliber rifle.

Staloch helped establish Cass County’s 4-H shooting range and meets with youths one night each week during 10 weeks in the summer. “The basic philosophy of 4-H is teaching lifetime skills,” he says, and he believes the Shooting Sports program fits that philosophy.





“One of the skills it teaches is the safe handling of firearms,” Courneya says. “It also teaches respect and conservation ethics for the outdoors and the natural environment.”

Forging a better connection to North Dakota, its values and its natural resources may help keep these young men and women in the state as they become adults, he says. And youngsters who develop relationships with adult leaders may be more likely to volunteer as adults.

As it continues to grow, the Outdoor Skills program will begin to include other programs. A sport fishing program is in the pilot phase. Camping will be introduced as a pilot program in 2006 and outdoor recreation, which includes everything from golfing to snowmobiling, will be introduced in 2008.

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Research Fees Implemented on New NDSU Plant Varieties

NDSU and the NDSU Research Foundation have implemented a research fee on all new NDSU varieties of wheat, durum, barley, oats and flax.

Research fees have been levied on all NDSU potato varieties since the early 1990s, on dry edible beans since 2001 and on an oat variety since 2002. Fees have been collected on all soybean varieties since 1995 at the request of the North Dakota Soybean Council. Fees are also levied on corn inbred lines.

“Variety development is an important activity of the North Dakota Agricultural Experiment Station,” says Ken Grafton, NDAES director. “With these fees, NDSU is looking forward to and planning for maintenance and enhancement of its breeding programs over the long term.

“Commodity group support has been strong in the past, but they have limited resources,” Grafton says. “Also, state and federal dollars for operational activities have decreased in real dollars during the last several years.”

The fees collected are used to:

- Maintain or expand existing and/or new research efforts in variety development
- Expand the screening and development of experimental lines
- Support disease and pest resistance research related to variety development
- Expand both the equipment and technical support staff for more production-related research
- Identify unique traits or characteristics in varieties that may increase their value to the industry and producers
- Maintain and/or expand off-season (winter) nurseries, reducing the time needed to develop new varieties
- Ensure the long-term viability of the NDSU breeding programs
- Purchase, replace or maintain equipment used in some programs

The NDSU Research Foundation will contract with state certifying agencies or crop improvement associations that have the capabilities to collect and remit the research fees. In states where there is no means to collect the fees, the Research Foundation will grant a nonexclusive license to individuals or explore contracting with other organizations or entities.

Per-bushel research fees for registered and certified class seed are 30 cents for wheat and durum, 25 cents for barley, 20 cents for oats and 40 cents for flax. Existing fees are 3 percent of gross seed sales for potatoes, 50 cents per bushel for conventional soybeans, 42 cents per 50-pound unit for transgenic soybeans and \$2 per hundredweight for dry edible beans. Corn inbred fees vary according to the percentage of the hybrid.

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Identity Preservation an Alternative for Small Farms and Elevators

For producers looking to increase income while reducing or maintaining the number of acres they farm, producing identity-preserved crops may be an attractive option, according to Cole Gustafson, NDSU agricultural economist.

In some cases, customers are willing to pay a premium for grains that have unique characteristics, such as corn with high oil content. To best market these grains, farmers must keep them separate from other crop varieties. This concept is known as identity preservation (IP).

Rudy Radke, agriculture diversification specialist with the NDSU Extension Service, and Gustafson say there are tremendous IP opportunities in North Dakota. “There are contracts available for commodity crops, as well as specialty crops,” Radke says. Gustafson adds that there is a growing interest in organic production.

Radke also views IP as an option for small elevators that are closing because of overwhelming competition. An elevator operator can make his or her facility cleanable like a seed operation and then enter into IP contracts and markets. The enterprise provides more dollars with less volume.

Although the profits can be high, Gustafson points out that there is a need for extensive planning in any type of IP enterprise. “There are a number of issues to face, including promotion, negotiation, liability and risk,” he says. “The key is to take the time to identify markets. Know what consumers are looking for and how crops are being used.”

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The Perfect French Fry – What Is It?

Soggy? Chewy? Slimy? Pasty? How was your last french fry? Consumers are choosy about their fries, says Susie Thompson, NDSU potato breeder, and that’s why fry testing is an important part of NDSU’s potato breeding program.

Thompson and her colleagues at NDSU and the USDA Agricultural Research Service Potato Research Worksite in East Grand Forks, Minn., test french fries for factors such as flavor, texture, color, sugar and percent of solids.

The potato breeding project team evaluates advanced selections and cultivars grown in test plots at various locations across the state. Data gathered from testing procedures are used to determine which selections to evaluate further and which to drop.

Research may continue as long as 10 to 16 years before a cross can be released. In 2004, NDSU released a cultivar named Dakota Jewel. Thompson says this variety is not suitable for french fries but is instead a pretty, red-skinned potato for the fresh market/tablestock industry.

Some of the selections that have been evaluated for french fry quality were again in field trials this year in locations, including Williston, Larimore and Tappen, N.D., and Park Rapids, Minn.

One of Thompson’s goals is to develop selections that fry acceptably light-colored directly from storage at temperatures of 38 to 42 degrees. At such low temperatures, producers need not rely on chemical sprout inhibitors, and breakdown caused by pathogens is reduced.

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Developing New Genetic Resources in Wheat

The National Science Foundation has awarded NDSU a \$1.8 million grant to develop new genetic resources in wheat. The lead researcher is Shahryar Kianian, associate professor in the Department of Plant Sciences.

NDSU is the lead institution for the project. Other universities involved are Oregon State University, the University of California-Davis, the University of Arizona and Kansas State University.

“Essentially, what we’re doing is ‘knocking out’ genes in a plant,” Kianian says. “Then we’ll look to see what happens to the plant. For example, we will be able to tell if a particular gene or set of genes makes the plant grow taller, shorter or able to better tolerate drought.”

The process of “knocking out” genes is called mutagenesis. During this process, genes are removed using certain chemicals. Kianian and his colleagues across the United States will generate about 40,000 mutated lines. They hope to establish international collaboration to eventually create 80,000 mutated lines.

“With that many lines, we will have ‘knocked out’ almost every gene in the plant,” Kianian says. “We’ll be able to tell what was beneficial or what was detrimental to the plant. In the long run, it will help us breed wheat varieties that are better adapted to the needs of the food processing industry or have unique utility in the market.”

Mutagenesis is different than transgenic research, Kianian notes. “With mutagenesis we are removing a gene that exists in the plant, while transgenic research involves adding genes from a different source. All of the gene knockouts are chemically induced.”

In nature, about one of every million wheat seeds mutates, Kianian says. “If you walk through a field, you’ll eventually notice one plant that is taller, shorter or has some other variation. In some cases, the mutated plant would be very beneficial for producers to grow; however, it may take someone a lifetime to find that plant. Mutagenesis greatly speeds up that process.”

The mutated seeds will be stored at NDSU as well as the other four universities. Kansas State University, through its Wheat Genetics Resource Center, will be responsible for distributing the seeds to the public. “We will also develop a database to disseminate the information generated by this research and future experiments to the public,” Kianian says.

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New Horticulture Garden Blooms Next Year

A new NDSU horticulture garden will provide the campus with a splash of color next year, according to Ron Smith, NDSU Extension horticulturist.

The raised beds of daylilies, irises, perennials and annuals will brighten the corner of 18th Street and 12th Avenue North. Although the display will be dazzling next year, Smith hopes the garden will continue to grow and be improved through the years.

Wayne Larson, campus horticulturist, has been the backbone of the garden project, according to Smith. Larson is responsible for all mechanical aspects, including organization, soil mixing and planting.

Accompanying the garden in future years will be a welcome center, complete with a classroom, greenhouse and plenty of horticulture information.

“The Horticultural Demonstration and Research Plots are an impressively beautiful welcome to campus, in addition to providing wonderful teaching and research opportunities for students,” says NDSU President Joseph Chapman.

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Sustainable practices reduce labor and risk, also strengthen communities

With the couple's first little one arriving in December, Ryan and Jo Marie Kadrmass of Dickinson will have one more reason to farm as efficiently as possible. For Ryan, this means utilizing no-till and rotation practices to minimize labor requirements.

Ryan planted his first crop in 1991, the year he graduated from high school. Until 1999, he farmed with his father using conventional methods. When Ryan began farming independently in 2000, the transition to no-till was a natural move. "I can cover more acres with less labor," Ryan says.

In addition, Ryan has seen the benefits of soil and moisture conservation obtained through no-till practices. He grows corn and sunflowers, which require substantially more moisture than the small grains in his crop rotation. According to Ryan, it is the moisture retention of no-till farming that allows him to maintain the rotation he desires for diversity and control of diseases and weeds.

The crops included in Ryan's rotation are durum, winter wheat, malting barley, oil and confection sunflowers, and corn. He doesn't plant small grains in the same

field for more than two consecutive years. Ryan has also grown canola, and this year had experimental plots of grain sorghum and soybeans.

Through the years, Ryan has built a positive relationship with the Dickinson Research Extension Center, consulting with agronomists on issues such as insect and disease management. He also uses results from the center's test plots to help him make cropping decisions.

Ryan is particularly excited about one project the center has recently undertaken. Roger Ashley, area Extension agronomist at the DREC, and Jim Nelson, retired assistant director, helped design a cross-slot no-till drill for demonstration and research plots. Todd Mayer and Dean Kovash, Steffes Corp. engineers in Dickinson, supervised the final design and fabrication.

"This drill will allow us to properly place seed and fertilizer in high- and low-residue situations, wet or dry and hard or soft soil conditions found in western North Dakota," says Ashley. The drill utilizes new technology for low-disturbance seeding and fertilizing.

"The less disturbance there is, the better the crop is," Ryan says. "I was very happy to see the center get this piece of equipment. It is new to the area, and if it works, great. If not, it saves farmers the hassle and money of trying it themselves."

The cross-slot drill is only one component of the DREC's mission, *Maka Glu Tecaya*, which means renewal of the earth through sustainable practices. DREC researchers have been comparing both no-till and crop rotation to conventional management practices for several years, according to Pat Carr, center agronomist. "We have found that moving to no-till increases wheat yield around 45 percent and practicing crop rotation an additional 26 percent, on average," he says.

Sustainable practices benefit more than just the farming family, according to Rich Wardner, executive director of the Dickinson Area Chamber of Commerce. "The more success young families like Ryan and Jo Marie experience working in agriculture, the more success the Dickinson area will experience," he says. "The research conducted at the Dickinson Research Extension Center is one key to the success of beginning agribusiness producers."

Research continues on finding ways to keep farm families in rural communities by reducing risk and making production agriculture less labor intensive. For producers like Ryan Kadrmass, the research is welcomed. After all, it will be years until the little one will be able to help on the farm.

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Building communities through Rural Leadership North Dakota

Michelle McCormack, the business and member services manager for Slope Electric Cooperative in New England, never envisioned herself as a leader.

But after completing the first year of the Rural Leadership North Dakota program, she has emerged as a force in her community of 555 residents.

Rural Leadership North Dakota (RLND) is a two-year interactive study and travel program dedicated to producing graduates with the vision and commitment to lead themselves, their organizations and their communities into the future. This program emphasizes the development of skills such as working with people, managing projects, using technology, speaking in public and bringing about positive change.

The 25 participants are applying what they've learned so far to a local community project. Those projects range from recreation to tourism to economic development, says Marie Hvidsten, RLND program director at NDSU. The program is led by NDSU Extension Service staff and partially funded through the NDSU President's Office.

"The projects all stem around wanting to improve the community and the people within the community, their standards of living," Hvidsten says. "They're really bringing up the community to be either more

beautiful or to have more recreational activities or to have more economic opportunities. I think people are always going to be thinking about those quality-of-life issues."

For her project, McCormack became involved with her community's efforts to build a new swimming pool. "I thought maybe I can make a difference in this project," she says, so she attended her first meeting of the pool committee well prepared.

"It was good practice for the things I was learning in the leadership seminars: Start with ourselves and find our passion, the things that light a fire in us, then go further out and deal with the diversity of people in your community," McCormack says.

Since joining the pool committee, she has helped develop posters of the architect's drawings of the new swimming pool to post around town. She helped draft a fund-raising letter and worked on grant applications. She also helped organize the committee's largest fund-raiser. After two summers without a swimming pool, the community will have a new pool next summer.

"The idea is that you take on a project during your two-year training and use it as a launching pad," McCormack says. From the swimming pool project, she wants to get involved in efforts to create an artists community.

"We've all done leadership by the seat of our pants," McCormack says. Her enrollment in the Rural Leadership North

Dakota program prompted her to analyze her leadership skills, then apply them. "You find out that the leader isn't necessarily the guy standing out front."

Brent Ekstrom, Lincoln, has also found success in his RLND project. He is working to establish a revolving loan fund in a 10-county area served by the Lewis and Clark Regional Development Council, where he is a loan fund manager.

He hopes to raise \$600,000: \$450,000 from U.S. Department of Agriculture Rural Development and \$150,000 from counties. While his project is directly tied to his employment, his leadership training helped launch the project. "Working with Rural Leadership, coming up with ideas on how we can help, ignited this a little bit more, pushed it to the forefront," he says. "I've seen the effects of what these revolving loan funds can do."

"There is a lot of potential," Hvidsten says of the Rural Leadership North Dakota projects under way across the state. "The project is really the application of the information."

Participants have completed five sessions as they enter their second year of the program. This winter's plans include a study tour to Washington, D.C., so participants can learn how to connect their activities in North Dakota with Washington.

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Rural
Leadership
NORTH DAKOTA



Teaching people. Leading programs. Answering questions. All are included in a day's work for Doug Bichler and Sue Isbell, the Grant County Extension agents.

"The Extension agent should be a wealth of information," Bichler says.

Extension agents: creating learning partnerships

Others agree. "He's the person the agricultural community looks to for current and updated information," says Sue Isbell, Bichler's colleague. "He is both a resource person for the county and a leader." Isbell is a wealth of information herself, working with both the Family Nutrition Program and 4-H.

Bichler and Isbell's roles, through the NDSU Extension Service, are to create learning partnerships that help adults and youth enhance their lives and communities.

Fulfilling that mission means Extension agents rarely have a "typical" day. Bichler receives up to 100 e-mail messages a week and averages five to 10 telephone calls a day from Grant County residents. A portion of his day is then spent finding information to answer those questions.

He's formulated lamb and calf feed rations, identified cutworm damage and diagnosed tree diseases. Among the norm come oddball questions that make the job really fun, he says. "For example, how do you keep a woodpecker from continually damaging the siding of a house?"

Isbell reaches up to 200 people a week through nutrition programs she presents everywhere from schools to senior citizen centers. She stops at a Head Start center to visit with parents and children about washing hands and food safety. She talks to senior citizens about getting the proper exercise. She has started a walking program, enrolling children as young as 10 and senior citizens as old as 99, who are logging the number of steps they take each day.

Their work expands the Extension Service's mission by creating learning partnerships between the agents and county residents. For example, Isbell partners with schools, local businesses, social service agencies, senior citizen organizations and the local media to help spread the word about proper nutrition.

"I want to increase nutritional awareness, the benefits of proper nutrition and physical activity," she says. "I would also like to develop youth leadership skills through the 4-H program."

"I believe (the Extension agent) is a vital asset to the county," says Merlin Leithold, the county weed officer and a 4-H leader. The information disseminated by the Extension agents is one foundation to the overall knowledge of the community, he says.

Bichler's background prepared him for his diversified role. As a youth, he milked cows and helped his parents raise beef cattle, sheep, pigs, horses and chickens, as well as small grains and row crops, on their diversified farm near Linton. After graduating from NDSU in 2002, he stepped into his current Extension Service role in 2003.

With a degree from Montana State University in home economics and Extension, Isbell also began working in Grant County in 2003. Her family also ranches north of Solen.

Bichler and Isbell also guide the county 4-H program, organizing the annual county fair and other programs that teach the youth skills they'll use throughout their lives.

With a bachelor's degree in animal science from NDSU, Bichler focuses on livestock production with the 4-H clubs he mentors. He gives showmanship demonstrations and visits the nine Grant County 4-H clubs throughout the year. Every weekend in February and March, he's traveling with 4-H livestock judging teams to competitions.



As the Grant County Fair quickly approached, Bichler spent his days entering exhibits into the computer, scheduling judges and organizing events for the fair. And as the adviser to the junior leader 4-H club, which organizes a mud volleyball tournament during the county fair, he was frantically searching for a solution to a mud pit problem. "As easy as that sounds, it's actually gotten pretty stressful because we're kind of on a budget and we're running out of time," he said with a laugh.

Isbell concentrated on the 4-H consumer choices program this year, teaching youth to make wise decisions. "Our goal is to take a team from Grant County to the state fair in 2005," she says.

"I just have tons of passion," Isbell says. "I love working with the people."

Finding Bichler in his office during the summer is a rare feat. By the end of August, he will have attended eight to nine fairs,

including serving as superintendent at the dairy and goat show during a week of the state fair. Between the 4-H livestock judging competitions and 4-H meetings, he logs plenty of weekend and evening work, not to mention the ever-present questions that can come anytime from anywhere.

"You never leave the office," he says. "You're always the county agent, it doesn't matter if it's 3 o'clock on Sunday."

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NDSU Weather Web Site Predicts Insect and Disease Development

An NDSU Web site provides hourly and daily weather data that can help farmers predict and combat crop insect and disease development.

"I like to think of this as actually doing something about the weather," said John Enz, an agricultural climatologist at NDSU who helped start the Web site in 1989 following a statewide drought the previous year. The North Dakota Agricultural Weather Network (NDAWN) began with six stations. Today it has 68.

Here's some of what www.ndawn.ndsu.nodak.edu has to offer:

- A wheat growth stage estimator. By entering a location and planting date, a wheat grower can obtain a table displaying daily and accumulated growing degree days and other information for each day since planting.
- A potato disease forecaster with maps showing the development and severity of late blight
- A small-grain disease forecasting system that identifies days with favorable conditions for the development of tan spot, Septoria blotch, leaf rust and scab
- A sclerotinia disease forecasting system, which helps North Dakota and Minnesota canola producers decide if they need to apply fungicide
- Crop water use and water shortage maps

NDSU research scientists are working on more disease, insect and crop prediction models for the Web site, Enz said.

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Experiment Station Releases New Crop Varieties

The North Dakota Agricultural Experiment Station released several new crop varieties during the past year.

Steele-ND is a new hard red spring wheat variety that:

- has good resistance to leaf and tan spot
- is about equal to Alsen in wheat scab resistance
- has good milling and baking properties, which are important to North Dakota's export market

Two new varieties of soybeans were released: LaMoure, a nontransgenic soybean, and RG405RR, a transgenic variety.

"To avoid confusion, all NDSU-developed transgenic soybean varieties will have a number and letter while nontransgenic varieties will continue to use names," says Al Schneider, NDSU Department of Plant Sciences chair.

LaMoure traits:

- matures three days earlier than Sargent and five days later than Barnes
- in growing tests, averaged 3.6 bushels per acre more than Barnes and 1.5 bushels more than Sargent
- has greater resistance to lodging and better tolerance to iron chlorosis than Barnes or Sargent
- has resistance to Phytophthora races 1 through 3

RG405RR traits:

- has exhibited good yield potential
- protein and oil percent are similar to Barnes and Sargent
- has resistance to Phytophthora races 1 through 3

Beach and Stark are new oat varieties developed by NDSU. Beach has a white hull color with relatively large kernels and is an extremely high yielding oat. The maturity is similar to Killdeer, and characteristics will make it a desirable variety for the racehorse oat market.

Stark is the second hullless oat variety released by the NDSU oat breeding program. Research indicates that hullless oats are an exceptional source of livestock feed. Stark yields about 10 percent more than Paul. Stark's straw strength, plant height, maturity, and stem and crown rust resistance are similar to Paul.

Carter, a yellow-seeded flax, is expected to replace acreage of Omega, the predominant yellow-seeded flax grown in the United States. Yellow-seeded flax is commonly used in bread, especially in Europe. Flax has significant health benefits because of its lignans and Omega-3 oil content.

Carter traits:

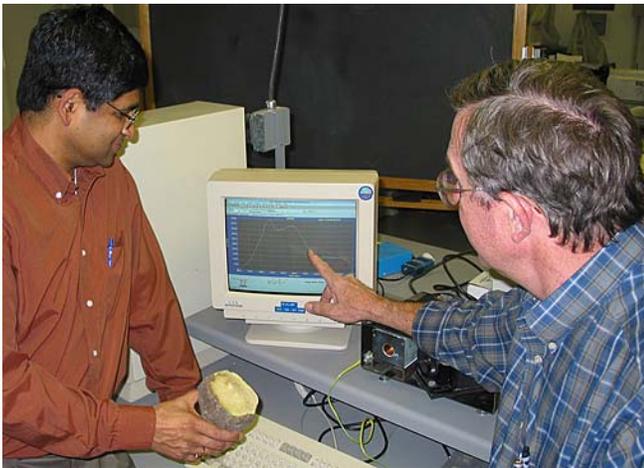
- in trials, Carter out-yielded Omega by almost 9 percent
- matures about one day earlier and is 1 inch shorter than Omega
- oil content is equal to Neche and slightly lower than Omega
- is resistant to all North American races of flax rust and has good resistance to flax wilt

Eclipse is the first black bean released by the NDAES. "This class of beans is becoming increasingly popular in the U.S. markets, and production is of growing importance in North Dakota," according to Schneider.

Eclipse is an early-maturing, high-yielding black bean with ovoid seed and a dull (opaque) black seed coat. It has purple flowers, a glossy dark green leaf and an erect (Type II upright, short vine) growth habit with excellent lodging resistance. Eclipse is resistant to bean common mosaic virus and anthracnose race 7, and has resistance to many races of rust currently found in North Dakota. Averaged across 14 locations in North Dakota, Eclipse produced 1.7 hundredweight per acre higher yield than T-39.

A new potato variety, Dakota Jewel, is a bright red-skinned cultivar suitable for the fresh market. It is expected to replace acreage of Dakota Rose, Red Norland and Red Pontiac in North Dakota. Dakota Jewel has improved storage characteristics relative to other red cultivars because it sizes early, sets skin in the field, retains its bright red color in storage and has long dormancy.

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NDSU Receives Sugar Sensor Patent

The NDSU Research Foundation received a patent this year for a sugar sensor that two associate professors in the Agricultural and Biosystems Engineering Department developed.

The sensor is capable of providing an instantaneous reading of the sugar content in sugarbeets. It combines near-infrared technology with statistical software to give producers a reliable analysis.

Vern Hofman said he and his colleague, Suranjan Panigrahi, worked on the sensor for about five years. The sensor was the result of work they were doing to develop a method of measuring sugarbeet yields in the field. The Sugarbeet Research and Education Board of Minnesota and North Dakota partially funded their research.

The sensor may provide an assessment as accurate as the testing at beet processing plants, Hofman said. The sensor tests a thin cross-section from the top of the beet and provides a reading in seconds, while the processing plant test involves turning a whole beet into pulp and analyzing it. That process takes 45 minutes to an hour.

The next step is miniaturizing the sensor, then testing it to make sure it works in its smaller form, according to Hofman. However, they will need more funding – an estimated \$50,000 to \$100,000 – for that, he said.

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Pulse Crops Growing in Popularity in North Dakota

With some help from NDSU researchers, lentils, dry peas and chickpeas are gaining favor with North Dakota farmers.

The state has become the No. 1 producer of dry peas and No. 2 in lentil production. Farmers planted 280,000 acres of dry peas this year, compared with 160,000 last year. This year they planted 90,000 acres of lentils, which is 35,000 more than in 2003.

Lentils, dry peas and chickpeas are known as pulse crops, or those that produce edible seeds from annual legumes. “Pulse” comes from a Latin word for a thick soup.

Jay Fisher, director of the North Central Research Extension Center at Minot, said pulse crops are generating more interest because they are excellent in rotation with cereal grain crops, they grow well in cool weather and researchers have developed some new varieties and ways to control weeds. These crops also have the ability to obtain much of the nitrogen they need from the atmosphere and have some left over for the

wheat, barley, durum or oat crop planted on the same field the next year. That means farmers won’t have to apply as much nitrogen to the following year’s crop, which will save them time and money, he said.

Blaine Schatz, director of the Carrington Research Extension Center, believes the interest in pulse crops results from the convergence of three scenarios: growers who recognized the crops’ potential, entrepreneurs who saw opportunities for opening processing plants and research at Research Extension Centers to support the crops’ expansion.

The growing number of markets for pulse crops statewide, nationally and worldwide is another reason for the jump in production, Schatz said. North Dakota has 33 businesses that buy one or more pulse crops. Some of those buyers are grain elevators that have been around for years, but some are specialty processing plants that didn’t exist just five years ago, he said.

Watching North Dakota go from not even being a player in the pulse crop industry to becoming the leading producer is exciting for NDSU researchers, he said. And don’t expect to see the interest waning anytime soon. “There’s room to expand,” he said.

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North Dakota Crop Land Values Show Greatest Increase in 25 Years

A recent survey indicates the greatest annual percentage increase in North Dakota land values since the late 1970s, according to Andrew Swenson, farm and family resource management specialist with the NDSU Extension Service.

Swenson based his calculations on surveys conducted by the North Dakota Agricultural Statistics Service in January 2004.

The numbers mark the fourth consecutive year of increased land values after slight declines in 1998 and 1999. The strongest increases occurred in the southeast central region, where average crop land values increased 17 percent to \$549 per acre and in the northeast central region, with a 13 percent increase to \$470. The values in the southwest central region at \$370, the northwest region at \$358, the south Red River Valley at \$1,059, and the southwest region at \$333 represented increases of 6 percent to 10 percent from the previous year. Crop land value in northwest central increased 3 percent to \$430, and the north Red River Valley showed a 2 percent increase to \$752.

Swenson notes that several economists have expressed concern that agricultural land values nationally may be reaching excessive levels. Although North Dakota crop land values are approaching the all-time high of about \$530 per acre set in 1981, in constant dollars (after adjusting for inflation), current values are about half of 1981 levels.

Swenson says the future of land values is tied to farm profitability, interest rates and the strength of the overall economy. In recent years, low returns on other investments have made land attractive to outside investors, and farmers have pursued land more aggressively because of improved farm profit and low interest rates. The risk is that these conditions, which have fueled demand for land, will change.

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